PATENT ABSTRACTS OF JAPAN

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(71)Applicant : HITACHI MAXELL LTD

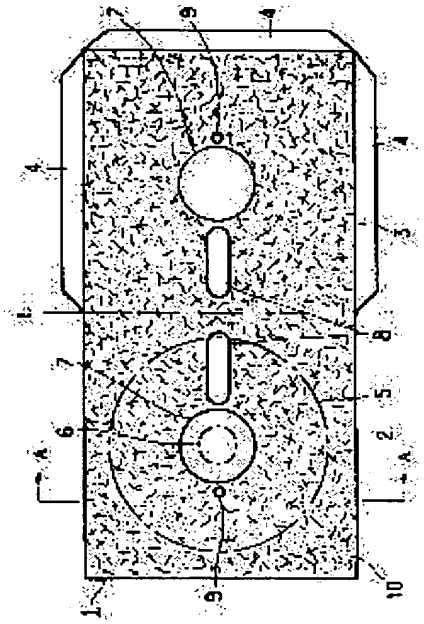
(72)Inventor : MIZUSHIMA KUNIO

(54) MAGNETIC DISC

(57)Abstract:

PURPOSE: To attain excellent and strong bonding between a liner and a package by fixing the liner made of non-woven fabric on one side of which a synthetic thermoplastic resin film is laminated to the inside face of the package while opposing the synthetic resin film side.

CONSTITUTION: The package 1 consists of a plastic-made sheet having left/right both side pieces 2, 3, a folding piece 4 for package circumference melting provided to the right side piece 3, and the left/right both side pieces 2, 3 are provided with an opening 7 corresponding to the center opening 6 of a magnetic disc main body 5 inserted and stored between both the pieces, a magnetic head insertion slit 8 and a sector index port 9. The liner 10 is made of non-woven fabric one side of which a synthetic thermoplastic resin film is laminated, the synthetic thermoplastic resin film 12 laminated onto one side of the unwoven cloth 11 is adhered by thermal melting while the film 12 is opposed to the inner side face of the package 1 so as to improve the bonding performance between the liner 10 and the package 1. The strength of the package is reinformed and strengthened through the insertion of the synthetic thermoplastic resin film 12.



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G 11 B 23/033	101	A－7177－5D	

審査請求　有　発明の数 1　（全4頁）

⑤4発明の名称　磁気ディスク

⑳特　願　昭59－254731
㉒出　願　昭55(1980)12月2日
前実用新案出願日援用

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明　細　書

1．発明の名称

磁気ディスク

2．特許請求の範囲

1．磁気ディスク本体を外部から回転駆動並びに記録再生可能に収納体に収納した磁気ディスクにおいて、該収納体の内側面に、片面に熱可塑性合成樹脂フィルムをラミネートした不織布からなるライナーを、合成樹脂フィルム側を対接させて固着したことを特徴とする磁気ディスク

3．発明の詳細な説明

この発明は磁気ディスク本体を外部から回転駆動並びに記録再生可能に収納体に収納した磁気ディスクの改良に係り、その目的とするところはライナーと収納体との接着性が良好でかつ強度の優れた磁気ディスクを提供することにある。

磁気ディスクは、磁気ディスク本体への塵埃などによる汚染を防止するために収納体内に磁気ディスク本体を外部から回転駆動並びに記録再生可能に収納できるようにしたもので、通常、収納体は塩化ビニルシートなどのプラスチック製シートにレーヨン繊維およびポリプロピレン繊維などからなる不織布などのライナーを熱溶着によって貼着し、収納する磁気ディスク本体の中央開口に対応する開口部や磁気ヘッド挿入口などを打ち抜き形成した後、折曲並びに融着加工処理を施してつくられている。

ところが、レーヨン繊維およびポリプロピレン繊維などからなる不織布は、プラスチック製シートなどのプラスチック材からなる収納体に対する熱溶着性が必ずしも充分に良好でなく、熱溶着の条件を強くすると収納体の変形が生じて出力異常等の原因となり、反対に熱溶着の条件が弱い場合には接着力が低下して磁気ディスク本体の回転により不織布がずれたりする。また強度も必ずしも充分ではなく、長時間使用または保存したりすると変形する場合がある。

この発明者はかかる現状に鑑み種々検討を行った結果、不織布の片面に熱可塑性合成樹脂フィルムをラミネートし、これをライナーとして合成樹

脂フィルム側を収納体の内側面に対接して熱溶着すると、熱溶着性の良好な熱可塑性合成樹脂フィルムの介在によって、たとえ加熱温度が低い場合でも熱溶着が容易に行え、ライナーと収納体との接着性が充分に良好になるとともに、補強作用も発揮されて収納体の強度も改善されることを見いだし、この発明をなすに至った。

不織布の片面にラミネートされる熱可塑性合成樹脂フィルムの素材としては、塩化ビニル樹脂、塩化ビニル－酢酸ビニル共重合体、ポリエチレン樹脂、ポリアミド樹脂などの熱可塑性合成樹脂が好適なものとして使用され、これらの素材からなる熱可塑性合成樹脂フィルムは、これらのフィルム又は接合面に接着剤を塗布したこれらのフィルムと不織布を重ね、熱圧着ロールの間に通して不織布の片面にラミネートされる。この場合、ラミネートは熱可塑性合成樹脂フィルムと不織布とを全面で熱圧着する必要はなく、部分的に熱圧着するものであってもよい。このようにしてラミネートされる熱可塑性合成樹脂フィルムの厚みは0.01㎜より薄いと熱溶着性が悪く、0.3㎜より厚くすると溶着時に溶けた樹脂の一部が不織布にしみこんで反対面に滲出し、磁気ディスク本体を汚染または損傷したりしてエラー発生の原因となるため0.01～0.3㎜の範囲内の厚みにするのが好ましく、0.03～0.2㎜の厚みにするのがより好ましい。

なお、このような熱可塑性合成樹脂フィルム中にはカーボンブラックを含有させてもよく、カーボンブラックを含有させるとこのカーボンブラックによってライナーの導電性が向上され、帯電防止機能が発揮されるため磁気ディスク本体との摺接による静電気の発生が良好に防止される。このカーボンブラックの含有量は、5重量%より少ないと導電性がそれほど良好にならないため静電気の発生を有効に防止できず、反対に70重量%より多くすると熱可塑性合成樹脂フィルムの熱溶着性が劣化するおそれがあるため、5～70重量%の範囲内で含有させるのが好ましく、10～50重量%の範囲内で含有させるとより好ましい結果が得られる。

以下、図面に基づいてこの発明を説明する。

第1図はこの発明の磁気ディスク収納体の一例を展開して示したもので、図に示すように展開された収納体1は中心線Lから折り曲げられる左右両側片2および3と、右側片3に設けられた収納体周縁融着用折り曲げ片4とを持つ塩化ビニルなどのプラスチック製シートからなり、左右両側片2および3に、この両片間に介挿されて収納される磁気ディスク本体5の中央開口6に対応する開口部7、磁気ヘッド挿入口8およびセクタ標示口9がそれぞれ対応して設けられている。この収納体1は上記のようにプラスチック製シートに限らずプラスチック材の成型によるケースであってもよく、また、プラスチック以外の紙、金属から構成されてもよい。

10はこの収納体1に上記した各開口を閉塞しないように貼着されたライナーで、このライナー10は前述したように片面に熱可塑性合成樹脂フィルムをラミネートした成織布からなり、第2図で示されるように不織布11の片面にラミネートされた熱可塑性合成樹脂フィルム12側を収納体1の内側面に対接させて熱溶着することによって貼着されている。このため不織布11は熱溶着性に優れた熱可塑性合成樹脂フィルム12を介して収納体1に良好に貼着され、ライナー10と収納体1との接着性が一段と向上される。また不織布11と収納体1間には熱可塑合成樹脂フィルム12が介在するため収納体の強度も補強されて強くなり、長時間の使用によって収納体1が変形することもない。

このように不織布11の片面に熱可塑性合成樹脂フィルム12をラミネートしてなるライナー10の熱可塑性合成樹脂フィルム12中には、第3図に示すようにカーボンブラック13を混入してもよく、このようなカーボンブラック13が含有されるとライナー10の導電性が良好となるため静電気の帯電も有効に防止される。従って第3図に示される磁気ディスクではライナー10と収納体1との接着性が良好で収納体の強度も強化される上、さらに帯電防止機能も充分に発揮される。

この発明の磁気ディスクはこのように構成されてなり、この磁気ディスク収納体に磁気ディスク本体5を収納し、記録再生装置に装着した後、開口部7から導かれる駆動装置によって磁気ディスク本体5を高速回転させ、磁気ヘッド挿入口8から磁気ヘッドを、高速回転している磁気ディスク本体5に押し当てれば記録再生を行うことができる。

次に、この発明の実施例について説明する。

実施例

レーヨン繊維100%からなる綿を水流又は気流等を吹きつけて交絡させた後、加熱処理を施し、繊維を結着させて坪量35g/㎡、厚さ0.20㎜の不織布をつくった。次いでこの不織布の片面に厚さ0.05㎜の塩化ビニル-酢酸ビニル共重合体からなるフィルムをラミネートしてライナーをつくり、このライナーを厚さ0.25㎜の塩化ビニルシートに温度200℃で熱溶着し、所定の開口部を打ち抜いた後、折曲加工並びに融着加工を行って磁気ディスク収納体をつくった。

比較例1

実施例において、塩化ビニル-酢酸ビニル共重合体からなるフィルムのラミネートを省いた以外は実施例と同様にしてライナーをつくり、塩化ビニルシートへの熱溶着を試みたが溶着することができなかった。

比較例2

実施例において、塩化ビニル-酢酸ビニル共重合体からなるフィルムのラミネートを省き不織布からなるライナーを塩化ビニルシートに熱溶着する際の溶着温度を200℃から300℃に変更して熱溶着を行った以外は実施例と同様にして磁気ディスク収納体をつくった。

実施例および各比較例で得られた磁気ディスク収納体について溶着強度をインストロンタイプの引張試験機で測定し、収納体である塩化ビニルシートの変形を目視で観察した。

下表はその結果である。

表

	溶着温度(℃)	溶着強度(g)	塩化ビニルシートの変形
実施例	200	23	殆ど認められない
比較例1	200	溶着しない	〃
〃 2	300	18	認められる

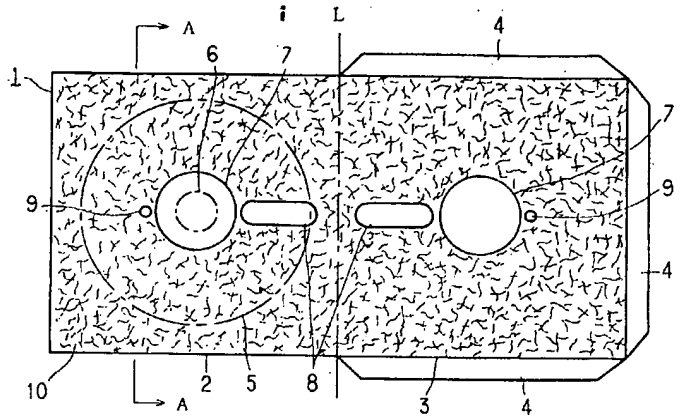
上表から明らかなように、不織布のみからなるライナーを収納体に熱溶着したもの（比較例1および2）では、熱溶着時の加熱温度が低くて200℃であるとライナーが収納体に溶着せず、熱溶着時の加熱温度を高くして300℃にするとライナーが収納体に溶着するものの収納体である塩化ビニルシートの変形が認められるのに対し、この発明で得られたもの（実施例）は熱溶着時の加熱温度が200℃であっても比較例で得られたものより強い溶着強度で溶着される上、収納体である塩化ビニルシートの変形もほとんど認められず、このことからこの発明によって得られる磁気ディスクはライナーと収納体との接着性が一段と向上されていることがわかる。

4．図面の簡単な説明

第1図はこの発明の磁気ディスク収納体の一例を示す展開図、第2図は第1図のA－A線拡大断面図、第3図はこの発明の磁気ディスクの他の例を示す拡大断面図である。

1…収納体、5…磁気ディスク本体、10…ライナー、11…不織布、12…熱可塑性合成樹脂フィルム

第 1 図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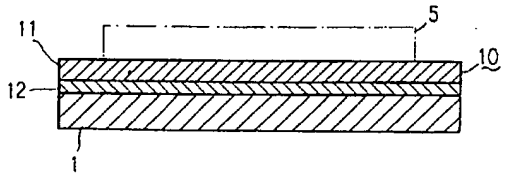
A

第 2 図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12
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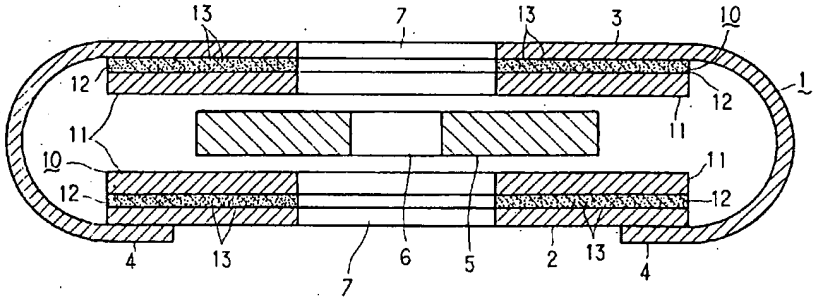
第 3 図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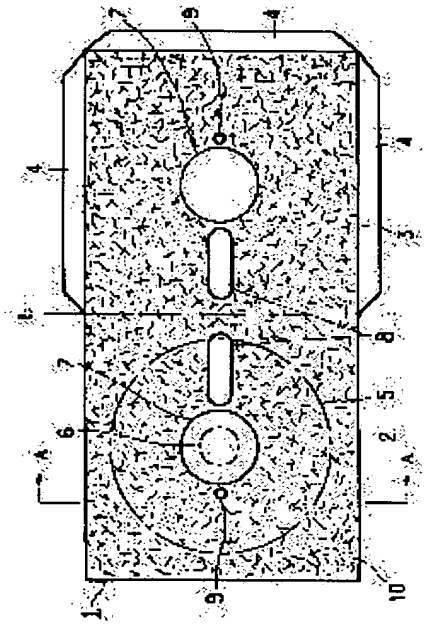

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Specification

1. Title of Invention

Magnetic Disk

2. Claim

A magnetic disk whose body is stored in a storage from the outside so that a rotation driving and a recording-reproduction are possible, characterized in that a non-woven cloth liner with a thermoplastic synthetic resin film laminated on one surface is fixed on the inner surface of the storage, bringing the synthetic resin film side into contact with it by a joining means.

3. Detailed Description of the Invention

This invention pertains to improved magnetic disks whose bodies are stored in storages from the outside so that a rotation driving and a recording-reproduction are possible. The purpose of the invention is to offer a magnetic disk with improved adhesiveness between a liner and a storage and with high strength.

In order to prevent a contamination of the bodies of magnetic disks due to a dust and the like, the disk bodies are stored in the storages from the outside so that a rotation

driving and a recording-reproduction are possible. The storages are usually formed as follow. Non-woven cloth liners made of rayon fibers and polypropylene fibers are adhered onto plastic sheets such as vinyl chloride sheets by a thermal fusion/adhesion means. The openings corresponding to the central openings of the bodies of the magnetic disks to be stored and the insertion openings for magnetic heads are formed by a punching means. After this, a bending process and a fusion process are applied.

However, the thermal fusibility of non-woven cloths made of rayon and polypropylene fibers to the plastic storages is not always sufficient. If the conditions for the thermal fusion/adhesion are reinforced, deformation of the storages occurs so as to cause in an output abnormality. In contrast, if the conditions for the thermal fusion/adhesion are weak, the adhesiveness decreases. As a result, the non-woven cloths are displaced due to a rotation of the bodies of the magnetic disks. The strength is also not always sufficient. When the liners are used or stored for a long period of time, they sometimes deform.

The inventor has carried out various studies in consideration of the aforementioned situation. As a result, the inventor has found the following fact and achieved the present invention. If a thermoplastic synthetic resin film is laminated onto one surface of a non-woven cloth and if a thermal fusion/adhesion is performed using this laminate is used as a liner and bringing the synthetic resin film side with contact with the inner surface of a storage, the thermal fusion/adhesion is easily carried out even if the heating temperature is low due to a presence of the thermoplastic synthetic resin film with sufficient thermal fusibility. The adhesiveness between the liner and the storage also becomes sufficient. A reinforcing effect is demonstrated so as to improve the strength of the storage.

The following thermoplastic synthetic resin materials are preferably used for the above thermoplastic synthetic resin film to be laminated on one surface of the non-woven cloth: vinyl chloride resin; a vinyl chloride-vinyl acetate copolymer; polyethylene resin; polyamide resin. The thermoplastic synthetic resin films made of these materials or these films with an adhesive applied on the joining surfaces and the non-woven cloth are overlapped. The films are laminated onto one surface of the non-woven cloth via thermo-pressure rollers. In this case, the laminate does not have to apply the thermo-pressure means on the entire surfaces of the thermoplastic synthetic resin film and the non-woven cloth. A partial thermo-pressure means can also be applied. If the thickness of the thermoplastic synthetic resin film laminated as described above is thinner than 0.01 mm, the thermal fusibility is insufficient. If the thickness is thicker than 0.3 mm, a portion of resin fused during a fusion is impregnated into the non-woven cloth to smear on the reverse surface. The magnetic disk body is contaminated or damaged. It results in an occurrence of errors. In order to avoid the errors, the thickness is preferably predetermined at 0.01 to 0.3 mm, more preferably at 0.03 to 0.2 mm.

Carbon black can be contained in the thermoplastic synthetic resin film. If carbon black is contained, the conductivity of the liner improves. A charge preventing function is also demonstrated.

Because of these advantages, the generation of static electricity between the liner and the disk body is sufficiently prevented. If the amount of the carbon black is smaller than 5 weight %, the conductivity does not become so sufficient. Thus, the static electricity cannot efficiently be prevented. In contrast, if the amount of the carbon black is larger than 70 weight %, the thermal fusibility of the thermoplastic synthetic resin film may

deteriorate. In order to prevent the deterioration, the carbon black is preferably contained at 5 to 70 weight %, more preferably at 10 to 50 weight %.

The invention is described hereinbelow with reference to the drawings.

Fig.1 illustrates a developed example of the magnetic disk storage of the invention. A storage developed in the drawing is made of a plastic (vinyl chloride) sheet that comprises left and right pieces 2 and 3 to be folded at a central line L and storage circumference fusing folding piece 4. An opening 7, an insertion opening 8 for a magnetic head and an indication opening 9 for a sector are individually provided to left and right pieces 2 and 3 in a corresponding fashion, which correspond to central opening 6 of a magnetic disk body 5 and are stored while being inserted between pieces 2 and 3. Storage 1 is not limited to the plastic sheet alone, but it can be a plastic material molded case. Paper and metals are also used other than plastic.

Reference number 10 refers to a liner adhered on storage 1 so that each aforementioned opening is not blocked. As mentioned above, liner 10 is made of a woven cloth wherein a thermoplastic synthetic resin film is laminated on one surface. As shown in Fig.2, the liner is adhered by applying a thermal fusion/adhesion while a thermoplastic synthetic resin film 12 side laminated on one surface of a non-woven cloth 11 is brought into contact with the inner surface of storage in a facing fashion. Because of this, non-woven cloth 11 is sufficiently adhered to storage 1 via thermoplastic synthetic film 12 with excellent thermal fusibility. As a result, the adhesiveness between liner 10 and storage 1 further improves. Because thermoplastic synthetic resin film 12 is presented between non-woven cloth 11 and storage 1, the strength of the storage is also reinforced. Thus, storage 1 does not deform even when it is used for a long period of time.

As shown in Fig.3, carbon black 13 can be mixed in thermoplastic synthetic resin film 12 of liner 10 wherein thermoplastic synthetic resin film 12 is laminated on one surface of non-woven cloth 11. When carbon black 13 is contained, the conductivity of liner 10 improves to effectively prevent the charge of static electricity. Accordingly, as in the magnetic disk as shown in Fig.3, the adhesiveness between liner 10 and storage 1 is sufficient, and the strength of the storage is reinforced. The charge preventing function is also sufficiently demonstrated.

The magnetic disk of the invention is constituted as above. Magnetic disk body 5 is stored in the storage of the magnetic disk. After the magnetic disk boy has been installed in a recorder reproducer device, it is rotated at a high speed using a driver brought from opening 7. The magnetic head is pressed against magnetic disk body 5 being rotated at a high speed from magnetic head insertion opening 8 so as to perform a recording and reproduction.

The embodiment of the invention is described next.

Embodiment

After rayon fiber cotton has been entangled by spraying a water stream or an air current, the fiber is bound by applying a heating treatment so as to obtain a non-woven cloth at a 35 g/m^3 weight at a 0.20 mm thickness. A liner is formed by laminating a vinyl chloride-vinyl acetate copolymer film at a 0.05 mm thickness on one surface of the non-woven cloth. This liner is then thermally fused at 200°C and adhered on a vinyl chloride sheet at a 0.25 mm thickness. After a predetermined opening has been created by a punching means, a bending process and a fusion process are applied so as to form a magnetic disk storage.

Comparative Example 1

A liner is formed as similar to as in the embodiment except for an omission of the vinyl chloride-vinyl acetate copolymer film laminate. This liner is thermally fused and adhered to a vinyl chloride sheet. However, it resulted in an insufficient thermal fusion/adhesion.

Comparative Example 2

A magnetic disk storage is formed as similar to as in the embodiment except for an omission of the vinyl chloride-vinyl acetate copolymer film laminate and a change in the fusion and adhesion temperature when a non-woven cloth liner is thermally fused and adhered on a vinyl chloride sheet from 200°C to 300°C.

The fusion/adhesion strengths of the magnetic disk storages obtained in the embodiment and the comparative examples are measured using an Instron type tensile testing machine. The deformation of the vinyl chloride sheets as storages is observed by eyes.

The results are indicated in Table as below.

Table

	Fusion/adhesion temperature (°C)	Fusion/adhesion strength (g)	Deformation of vinyl chloride sheets
Embodiment	200	23	Hardly identified
Comparative Example 1	200	Not fused/adhered	Hardly identified
Comparative Example 2	300	18	Identified

As is clear in the table, in the case of the magnetic disks wherein the liners made of non-woven cloths alone is thermally fused and adhered on the storages (Comparative Example 1 and Comparative Example 2), if the heating temperature is low at 200°C, the liners do not fuse and adhere on the storages. If the heating temperature is high at 300°C,

the liners are fused and adhered on the storages, and a deformation of the vinyl chloride sheets as storages is identified. In contrast, as for the magnetic disk obtained by the invention (Embodiment), even if the heating temperature during the fusion/adhesion is 200°C, higher fusion/adhesion strength that of the magnetic disks obtained by the comparative examples is achieved. The deformation of the vinyl chloride sheet is hardly identified. Therefore, further improved adhesiveness between the liner and the storage is evident in the magnetic disk of the invention.

4. Brief Description of the Invention

Fig.1 is a development illustrating an example of the magnetic disk storage of the invention. Fig.2 is an enlarged cross-sectional view cut along an AA line of Fig.1. Fig.3 is an enlarged cross-sectional view illustrating another example of the magnetic disk of the invention.

1...Storage

5...Magnetic disk body

10...Liner

11...Non-woven cloth

12...Thermoplastic synthetic resin film

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